

Appl. No. : 09/830,635
Filed : August 2, 2001

REMARKS

In response to the Office Action mailed September 13, 2004, Applicant has amended the application as above. No new matter is added by the amendments as discussed below. Applicant respectfully requests the entry of the amendments and reconsideration of the application in view of the amendments and the remarks set forth below.

Discussion of Claim Amendments

Claims 24, 26-28, 37, 45, 49-52, and 54-57 have been amended. Claims 58-61 have been added. Upon the entry of the amendments, Claims 24-61 are pending in this application. The amendments to Claim 24 are supported by, for example, Figure 1. The amendments to Claims 26-28, 37, 45, 49-52 and 54-57 are merely for clarification and do not narrow the scope of protection. New Claims 58 and 60 are supported by, for example, Figure 1. New Claims 59 and 61 are supported by, for example, Figure 1 and the specification at page 12, lines 21-24. Thus, no new matter is added by the amendments. Applicant respectfully requests the entry of the amendments.

Discussion of Specification Objection

The Examiner objected to the abstract of the disclosure because of the use of the phrase "The invention relates to." In order to expedite the prosecution of the application, Applicant has revised the abstract accordingly. Applicant has also removed reference numerals from the abstract. Withdrawal of the objection is respectfully requested.

Discussion of Drawing Objection

The Examiner objected to the drawings because the sectional views are not fully cross-hatched. In reply, Applicant submits herewith a set of formal drawings that overcome the objection. Withdrawal of the objection is respectfully requested.

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AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings include changes to Figures 1-6. Each of the attached sheets replaces each of the original sheets. The attached Figures 1-6 have been properly cross-hatched.

Attachment: Replacement sheets

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Discussion of Claim Rejections Under 35 U.S.C. § 102(e)

The Examiner has rejected Claims 24-26, 30, and 46-48 under 35 U.S.C. § 102(e) as being anticipated by Degani (U.S. Patent No. 6,100,475). The Examiner has also rejected Claims 24, 27-31, 34-35, 46-47, 49, and 53-54 under 35 U.S.C. § 102(e) as being anticipated by Shimada (U.S. Patent No. 6,087,597). Applicant respectfully traverses the Examiner's claim rejections as discussed below.

Standard of Anticipation

"For a prior art reference to anticipate a claim under 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference." *Diversitech Corp. v. Century Steps, Inc.*, 850 F.ed 675, 677, 7 USPQ 2d 1315, 1317 (Fed. Cir. 1988).

Discussion of Patentability of Independent Claim 24

Claim 24, as amended, recites, among other things, i) a second conductive path, coupled with a metallized contact pad, on the surface of the under-lying connection layer, and ii) a metallized hole having an inner surface thereof connected to the first conductive path. As discussed below, neither Degani nor Shimada discloses the above-recited claim terms.

1. Neither Degani Nor Shimada Discloses a second conductive path, coupled with a metallized contact pad, on the surface of the under-lying connection layer

Degani does not disclose a second conductive path, coupled with a metallized contact pad, on the surface of the under-lying connection layer recited in amended Claim 24. It is clear from Figure 5 of Degani that a conductor pad (27), arguably corresponding to the claimed metallized contact pad, is not connected to anything on the surface of a substrate (20). There is no disclosure in Degani regarding the second conductive path recited in Claim 24. In view of the above, Degani does not disclose the above-indicated claim term.

Shimada does not disclose a second conductive path, coupled with a metallized contact pad, on the surface of the under-lying connection layer recited in amended Claim 24. It is clear from Figure 2 of Shimada that a solder (31), arguably corresponding to the claimed metallized contact pad, is not connected to anything on the surface of a substrate (30). There is no

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disclosure in Shimada regarding the second conductive path recited in Claim 24. In view of the above, Shimada does not disclose the above-indicated claim term.

2. Neither Degani Nor Shimada Discloses “a metallized hole having an inner surface thereof connected to the first conductive path”

Degani does not disclose “a metallized hole having an inner surface thereof connected to the first conductive path” recited in amended Claim 24. Referring to Figure 5, Degani shows that a plating (15), arguably corresponding to the claimed metallized hole, is connected to a throughhole contact pad (16), arguably corresponding to the claimed first conductive path. Applicant respectfully submits that the plating (15) is a solid component in which no hole is defined. Furthermore, there is no passage formed between an inner surface of the solid plating (15) and the contact pad (16). *See Figure 5 of Degani.* Thus, an inner surface of the solid plating (15) cannot be connected to the throughhole contact pad (16). Therefore, Degani does not disclose the above-indicated claim term.

Shimada does not disclose “a metallized hole having an inner surface thereof connected to the first conductive path” recited in amended Claim 24. Referring to Figure 2 and column 3, lines 62-65, Shimada shows that a conductor pattern (23), arguably corresponding to the claimed metallized hole, is connected to a conductor pattern (24) and a pad (22), arguably corresponding to the claimed first conductive path. Applicant respectfully submits that the conductor pattern (23) is a solid component in which no hole is defined. Furthermore, there is no passage formed between an inner surface of the solid conductor pattern (23) and either the conductor pattern (24) or the pad (22). *See Figure 2 of Shimada.* Thus, an inner surface of the solid conductor pattern (23) can be connected to neither of the conductor pattern (24) and the pad (22). Therefore, Shimada does not disclose the above-indicated claim term.

3. Summary

As discussed above, neither Degani nor Shimada discloses i) a second conductive path, coupled with a metallized contact pad, on the surface of the under-lying connection layer, and ii) a metallized hole having an inner surface thereof connected to the first conductive path recited in

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amended Claim 24. Thus, neither of the references anticipates pending Claim 24, and thus Claim 24, as amended, is allowable over the cited prior art.

Discussion of Patentability of Independent Claim 47

Claim 47 includes similar claim terms as the above-recited claim terms of Claim 24. Claim 47 further recites that a conductive binding material is deposited in the metallized hole *to be in contact with the inner surface of the metallized hole*. As discussed below, neither Degani nor Shimada discloses the above-recited claim term of Claim 47.

Referring to Figure 5, Degani shows that solder material (51), arguably corresponding to the claimed conductive binding material, is formed on the plating (15). As discussed above, since the plating (15) is solidly formed, there is no passage through which the solder material (51) can contact an inner surface of the solid plating (15). Thus, Degani does not disclose that a conductive binding material is deposited in the metallized hole to be in contact with the inner surface of the metallized hole recited in Claim 47.

Referring to Figure 2, Shimada shows that solder material (13), arguably corresponding to the claimed conductive binding material, is formed on the conductor pattern (23). As discussed above, since the conductor pattern (23) is solidly formed, there is no passage through which the solder material (13) can contact an inner surface of the solid conductor pattern (23). Thus, Shimada does not disclose that a conductive binding material is deposited in the metallized hole to be in contact with the inner surface of the metallized hole recited in Claim 47.

In view of the claim terms i) and ii) of Claim 24, and in further view of the above-recited additional claim term of Claim 47, Claim 47 is allowable over the cited prior art. Withdrawal of the rejections is respectfully requested.

Patentability of Dependent Claims

Claims 26-31, 34-35, 46-49, and 53-54 depend from base Claim 24 or 47, and further define additional technical features of the present invention. In view of the patentability of their base claims, and in further view of their additional technical features, the dependent claims are patentable over the prior art of record. Furthermore, dependent Claims 37-45 have been indicated to be allowable by the Examiner.

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Discussion of Claim Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected Claims 32, 33, 36, 50-52, and 55-57 under 35 U.S.C. § 103 (a) as being unpatentable over Shimada. The Examiner has also rejected Claim 36 under 35 U.S.C. § 103 (a) as being unpatentable over Shimada in view of Jimarez (U.S. Patent No. 5,729,440). Claims 32-33, 36, 50-52, and 55-57 depend from base Claim 24 or 47, and further define additional technical features of the present invention. As discussed above, independent Claims 24 and 47 are allowable over Shimada. Thus, dependent Claims 32-33, 36, 50-52, and 55-57 are allowable over the prior art for at least the same reasons. Furthermore, since Jimarez does not remedy the deficiency of Shimada, dependent Claim 36 is allowable over the prior art of record.

Discussion of Patentability of New Claims 58-61

Each of new Claims 58 and 60 includes all of the claim terms of Claims 24 and 47, respectively, and further recites that there are *no solder bumps formed* between the under-lying (second) connection layer and the upper-lying (first) connection layer. Degani discloses solder bumps (26) formed between the two printed circuit boards (13, 20). *See Figure 5 of Degani.* Shimada discloses solder bumps (11) formed between the substrate (30) and the insulating film (21). *See Figure 2 of Shimada.* However, each of Claims 58 and 60 recites no solder bumps formed between the under-lying (second) connection layer and the upper-lying (first) connection layer. Removing those solder bumps would render the Degani and Shimada devices inoperable for their intended purpose. MPEP 2143.01.

Each of new Claims 59 and 61 includes all of the claim terms of Claims 24 and 47, respectively, and further recites that the contact node is for use with *unpackaged IC chips* for multichip modules. As clearly seen from Figure 5, Degani is directed to interconnecting two printed circuit boards for packaged IC chips. *See Figure 5 (reference numeral 19) of Degani.* However, each of Claims 59 and 61 recites that the contact node is for use with unpackaged IC chips for multichip modules. In view of patentability of their base claims and in further view of the above-recited features, new Claims 58-61 are patentable over the cited references.

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CONCLUSION

In view of Applicant's amendments to the application and the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: _____

12/10/04

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